

Status of Himawari Satellite Programs

Japan Meteorological Agency
17 July 2017

JMA's Geostationary Satellite Program

GMS (Geostationary Meteorological Satellite)

GMS
(Himawari)



Launched in 1977

GMS-2
(Himawari-2)



1981

GMS-3
(Himawari-3)



1984

GMS-4
(Himawari-4)



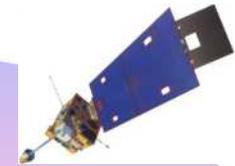
1989

GMS-5
(Himawari-5)



1995

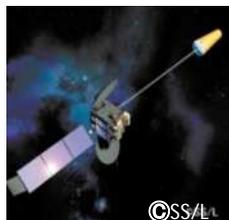
(GOES-9)



Back-up operation of GMS-5 with GOES-9 by NOAA/NESDIS from May 22, 2003 to June 28, 2005

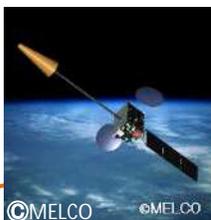
MTSAT (Multi-functional Transport SATellite)

MTSAT-1R
(Himawari-6)



Launched in 2005

MTSAT-2
(Himawari-7)



2006

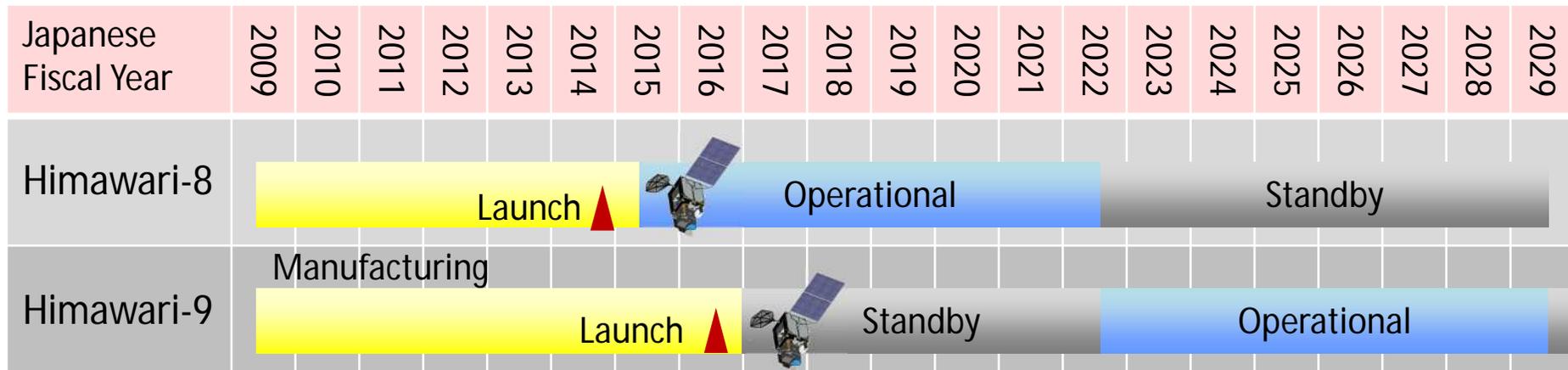
Himawari
Himawari-8 Himawari-9
Oct 2014 Nov 2016

Satellite	Observation period
GMS	1978 – 1981
GMS-2	1981 – 1984
GMS-3	1984 – 1989
GMS-4	1989 – 1995
GMS-5	1995 – 2003
GOES-9	2003 – 2005
MTSAT-1R	2005 – 2010
MTSAT-2	2010 – 2015
Himawari-8	2015 – 2022
Himawari-9	2022 – 2029

Himawari-8/9 Program



Himawari-8 has been operational since July 2015.



Himawari-9 has been an on-orbit spare since March 2017. It is expected to take over the service in 2022.

First Image Captured by Himawari-9

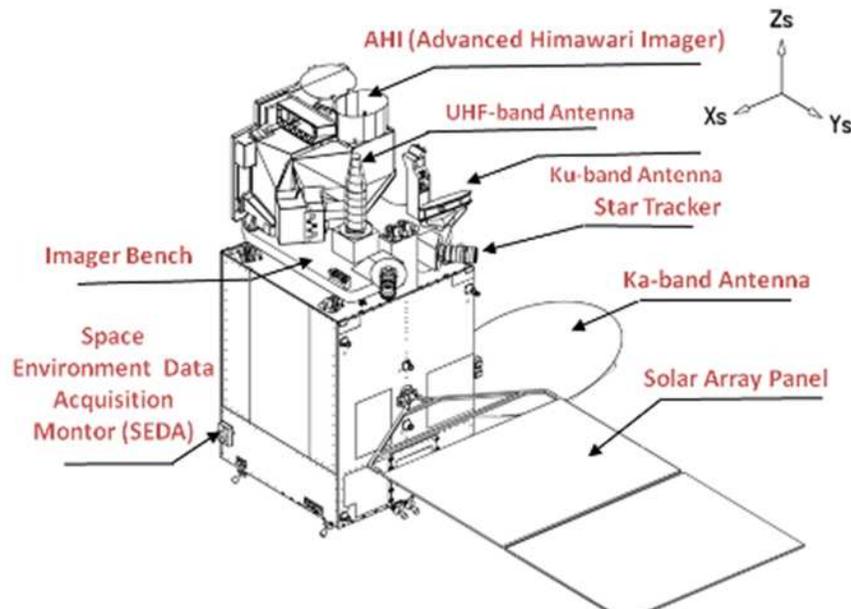


True Color Reproduction imagery

This imagery was developed on the basis of collaboration between the JMA's Meteorological Satellite Center and the NOAA/NESDIS GOES-R Algorithm Working Group imagery team.

0240UTC 24 January 2017

Himawari-8/9 Satellite



Major specifications of Himawari-8

Geostationary position	Around 140.7° E
Attitude control	3-axis attitude-controlled geostationary satellite
Imaging sensor	Advanced Himawari Imager (AHI)
Communications	1) Raw observation data transmission Ka-band, 18.1 - 18.4 GHz (downlink)
	2) DCS International channel 402.0 - 402.1 MHz (uplink) Domestic channel 402.1 - 402.4 MHz (uplink) Transmission to ground segments Ka-band, 18.1 - 18.4 GHz (downlink)
	3) Telemetry and command Ku-band, 12.2 - 12.75 GHz (downlink) 13.75 - 14.5 GHz (uplink)
Prime Contractor	Mitsubishi Electric Corporation
Launch vehicle	H-IIA rocket (planned)



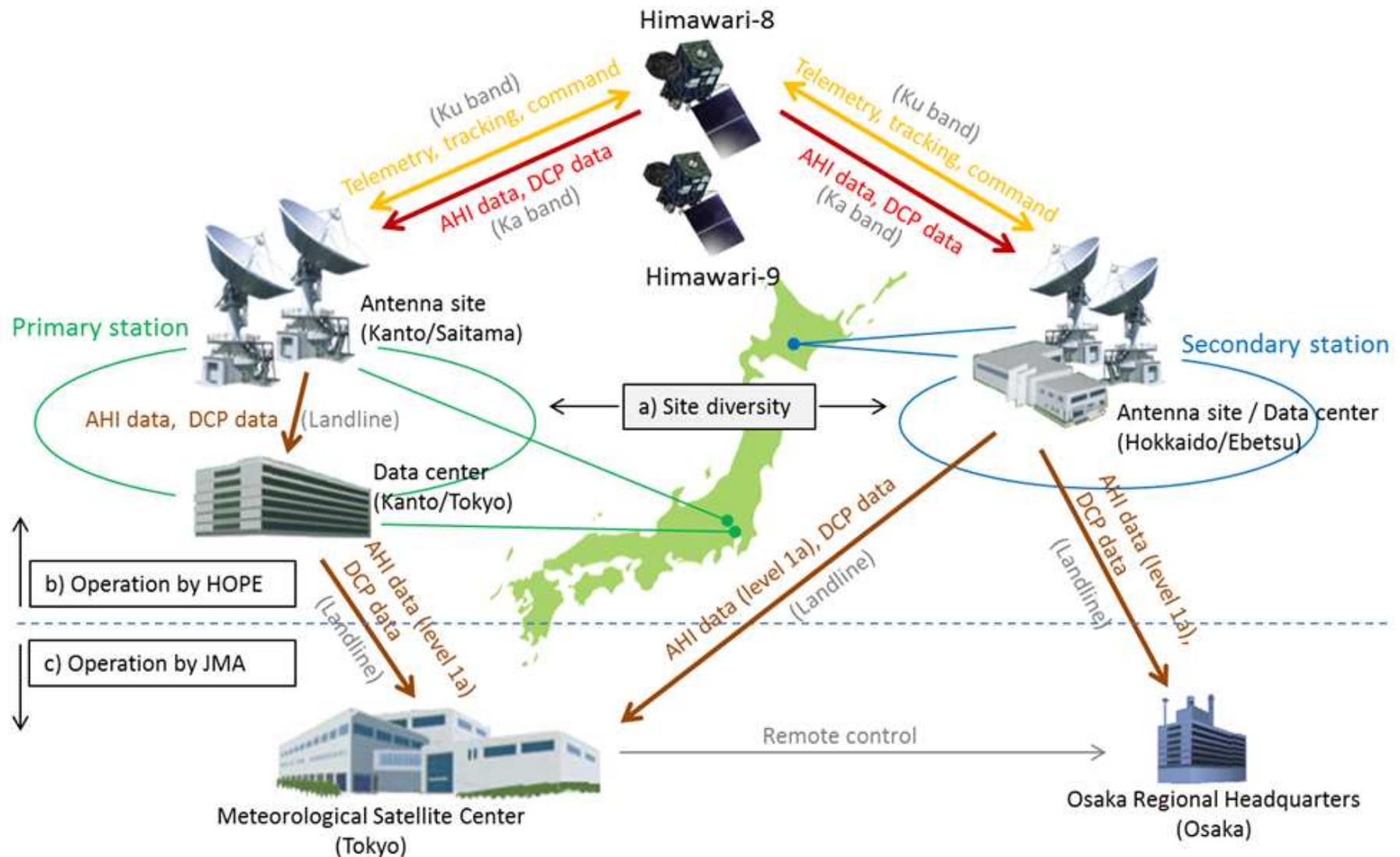
H-IIA31



Himawari-9

(Photo: Mitsubishi Heavy Industries Group) (Photo: Mitsubishi Electric Corporation)

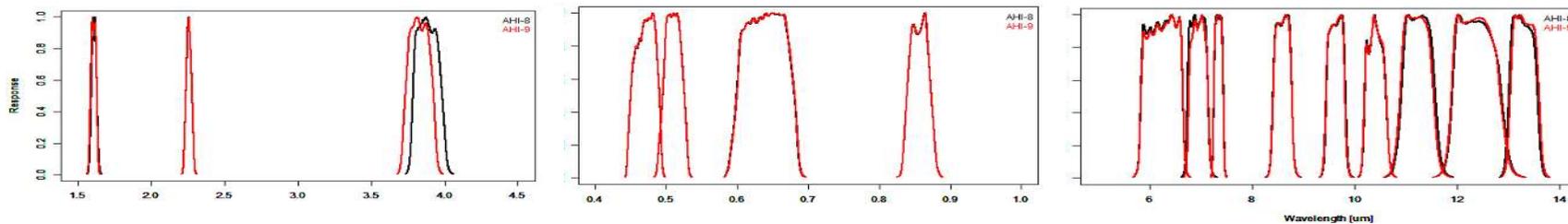
Overview of Himawari System



Advanced Himawari Imager (AHI)

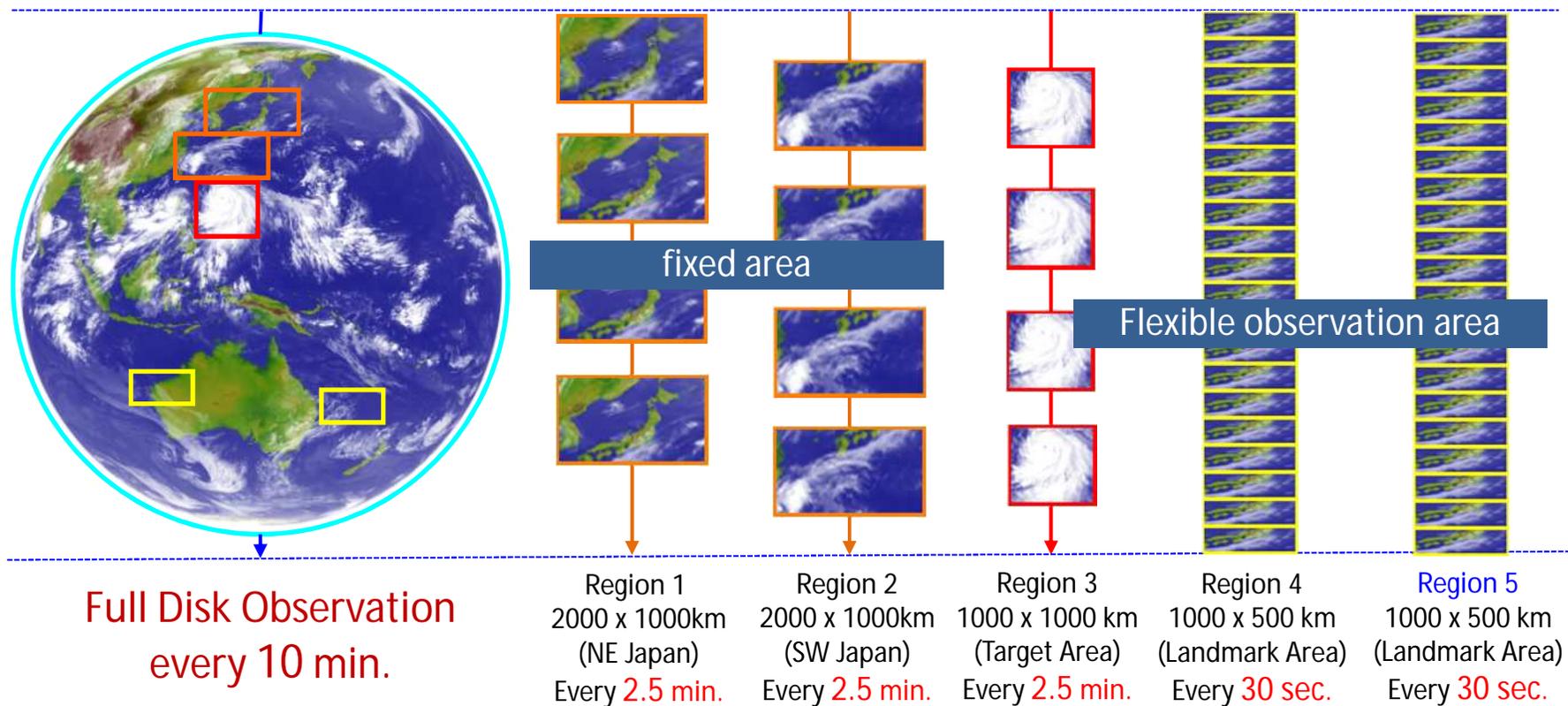


	Himawari-8/AHI		GOES-16/ABI		MTSAT-2/Imager	
Band	Center Wavelength	Spatial Resolution	Center Wavelength	Spatial Resolution	Center Wavelength	Spatial Resolution
1	0.47 μ m	1km	0.47 μ m	1km		
2	0.51 μ m	1km				
3	0.64 μ m	0.5km	0.64 μ m	0.5km	0.68 μ m	1km
4	0.86 μ m	1km	0.86 μ m	1km		
			1.38 μ m	2km		
5	1.6 μ m	2km	1.61 μ m	1km		
6	2.3 μ m	2km	2.26 μ m	2km		
7	3.9 μ m	2km	3.90 μ m	2km	3.7 μ m	4km
8	6.2 μ m	2km	6.15 μ m	2km	6.8 μ m	4km
9	6.9 μ m	2km	7.00 μ m	2km		
10	7.3 μ m	2km	7.40 μ m	2km		
11	8.6 μ m	2km	8.50 μ m	2km		
12	9.6 μ m	2km	9.70 μ m	2km		
13	10.4 μ m	2km	10.3 μ m	2km	10.8 μ m	4km
14	11.2 μ m	2km	11.2 μ m	2km		
15	12.4 μ m	2km	12.3 μ m	2km	12.0 μ m	4km
16	13.3 μ m	2km	13.3 μ m	2km		



Spectral response of AHI-8(black) and AHI-9(red) for visible, near-Infrared and infrared

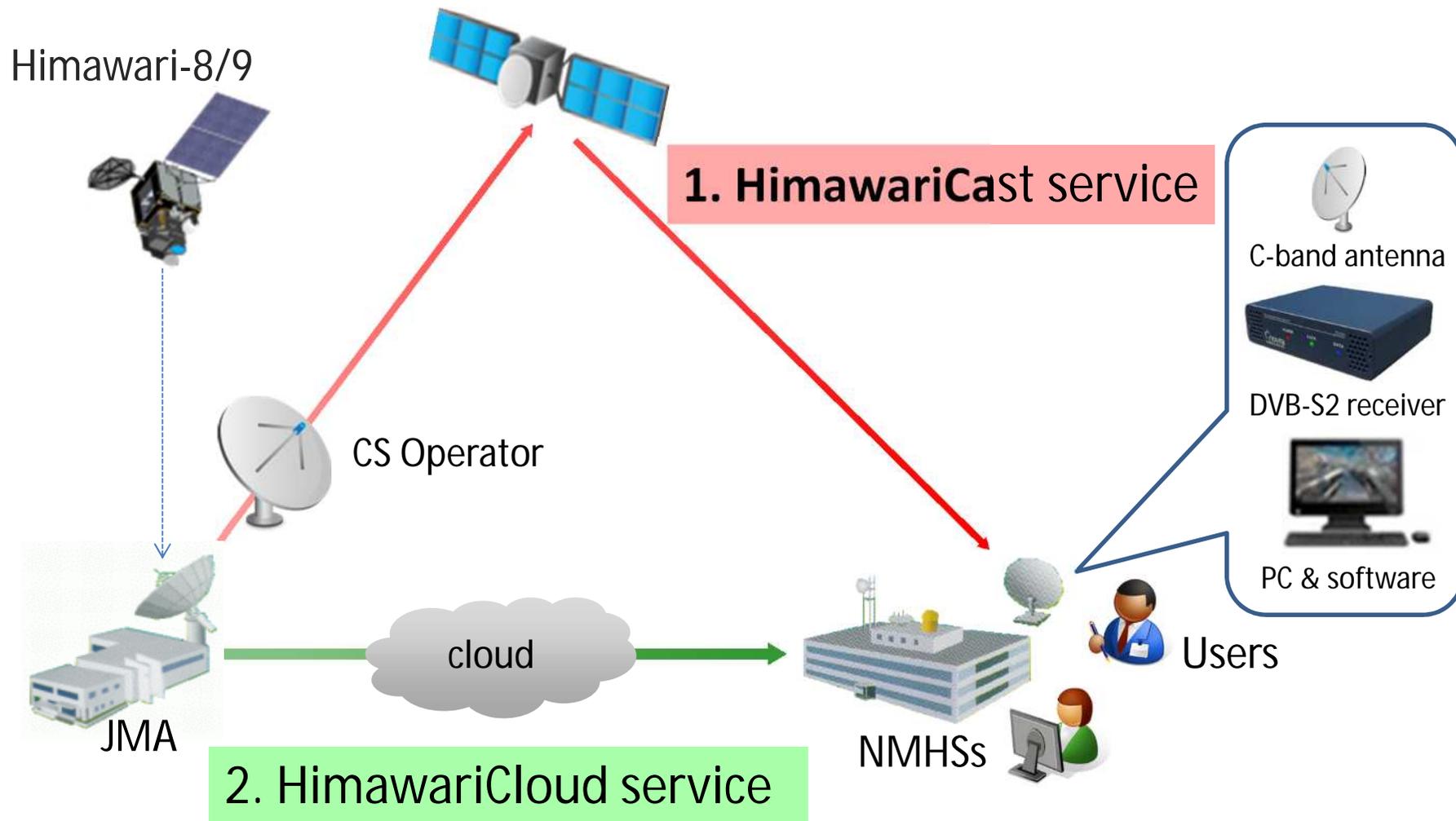
Observations in 10 minutes time frame



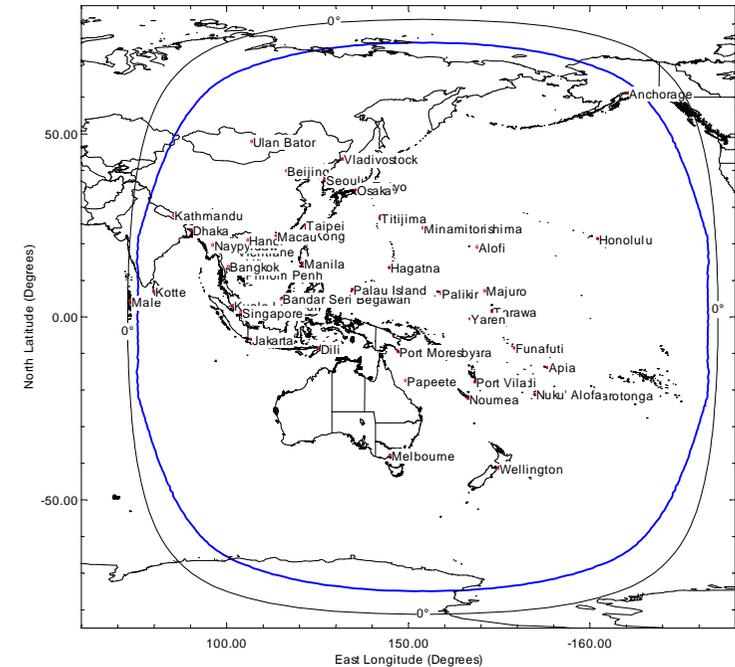
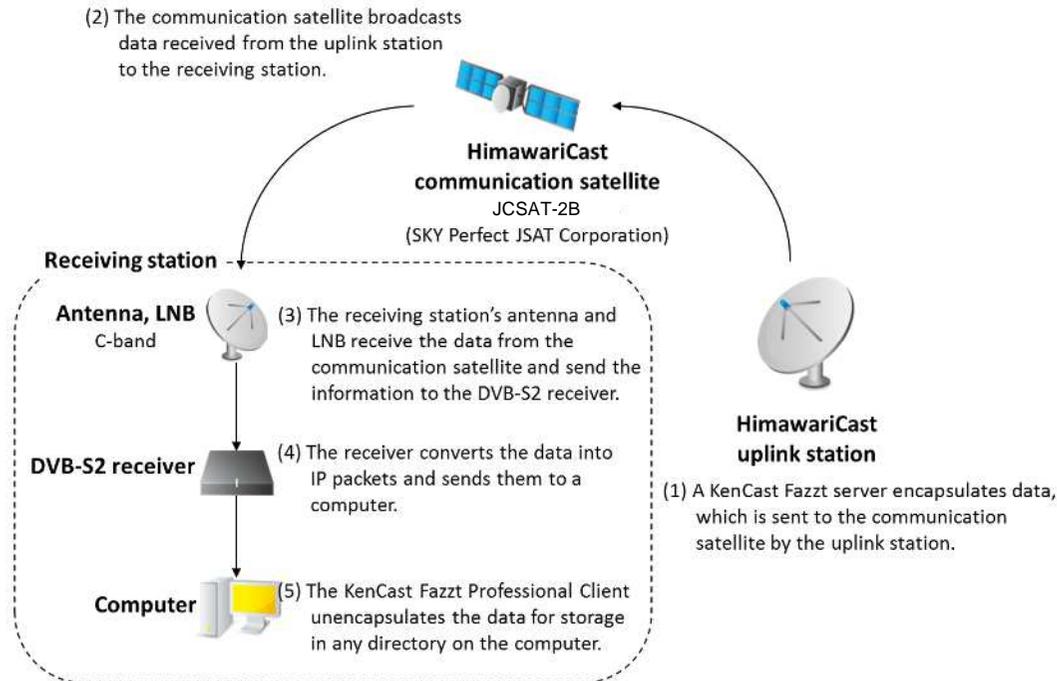
Data Services



Communication Satellite (CS)



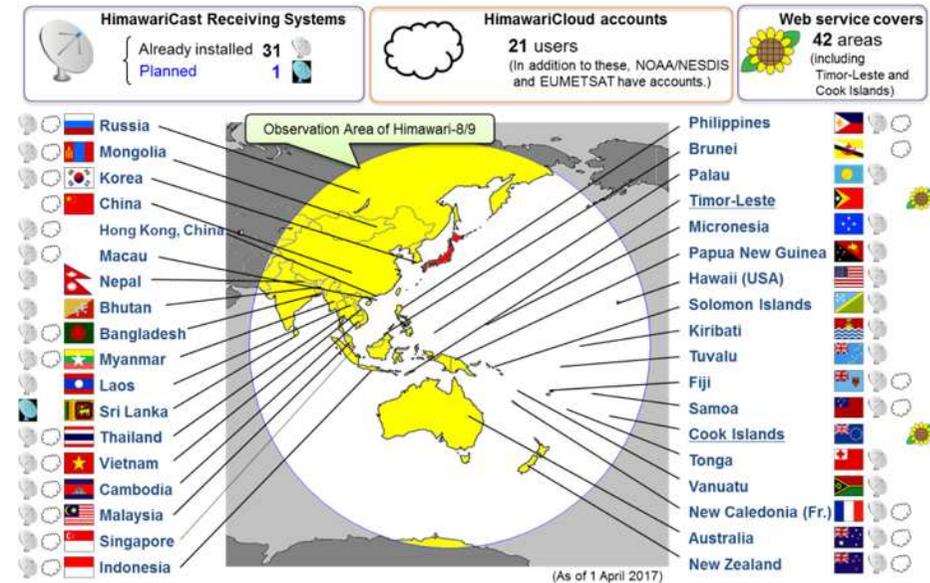
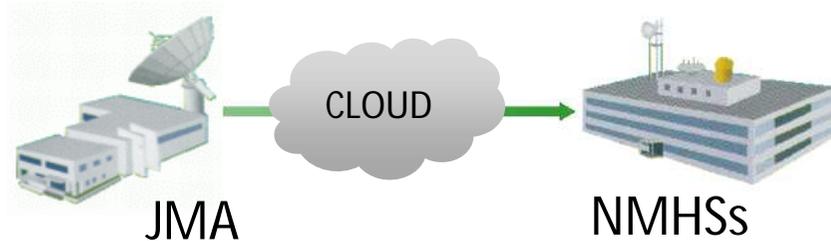
HimawariCast service



Data type	Format	Notes
Himawari imagery (full disk)	HRIT/LRIT data format (Compatible with the data format used in the MTSAT HRIT/LRIT services)	<ul style="list-style-type: none"> - Interval: 10 minutes - HRIT: 14 bands (VIS: 1 km, IR: 4 km) - LRIT: 4 bands (VIS, IR1, IR3, IR4: 5 km)
<ul style="list-style-type: none"> • NWP products • In-situ observations • ASCAT ocean surface wind 	SATAID format	<ul style="list-style-type: none"> - SATAID: Satellite Animation and Interactive Diagnosis

http://www.data.jma.go.jp/mscweb/en/himawari89/himawari_cast/himawari_cast.html

HimawariCloud service



Observation type	Format	Notes
Full disk (10-minute intervals)	<ul style="list-style-type: none"> Himawari Standard Data (HSD) PNG HRIT data format 	<ul style="list-style-type: none"> HSD: 16 bands (full resolution) PNG: True-color composite (1 km) same as the ones via HimawariCast
Target area (2.5-minute intervals)	<ul style="list-style-type: none"> HSD NetCDF PNG 	<ul style="list-style-type: none"> HSD: 16 bands (full resolution) NetCDF: 16 bands (latitude/longitude grid) PNG: True-color composite (1 km)

Redistribution



- Himawari data are redistributed to foreign and domestic R&D users by the following Japanese scientific institutes.

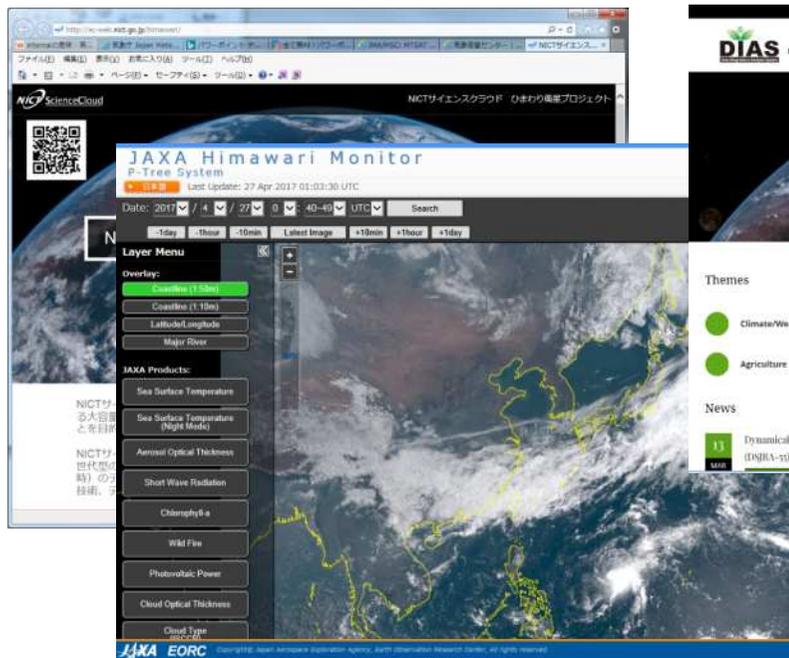
- NICT* (via Science Cloud)
- JAXA** (via Himawari Monitor)
- University of Tokyo (via DIAS***)
- Chiba University CEReS****

<http://sc-web.nict.go.jp/himawari/>

<http://www.eorc.jaxa.jp/ptree/index.html>

<http://www.diasjp.net/en/>

<http://www.cr.chiba-u.jp/english/>



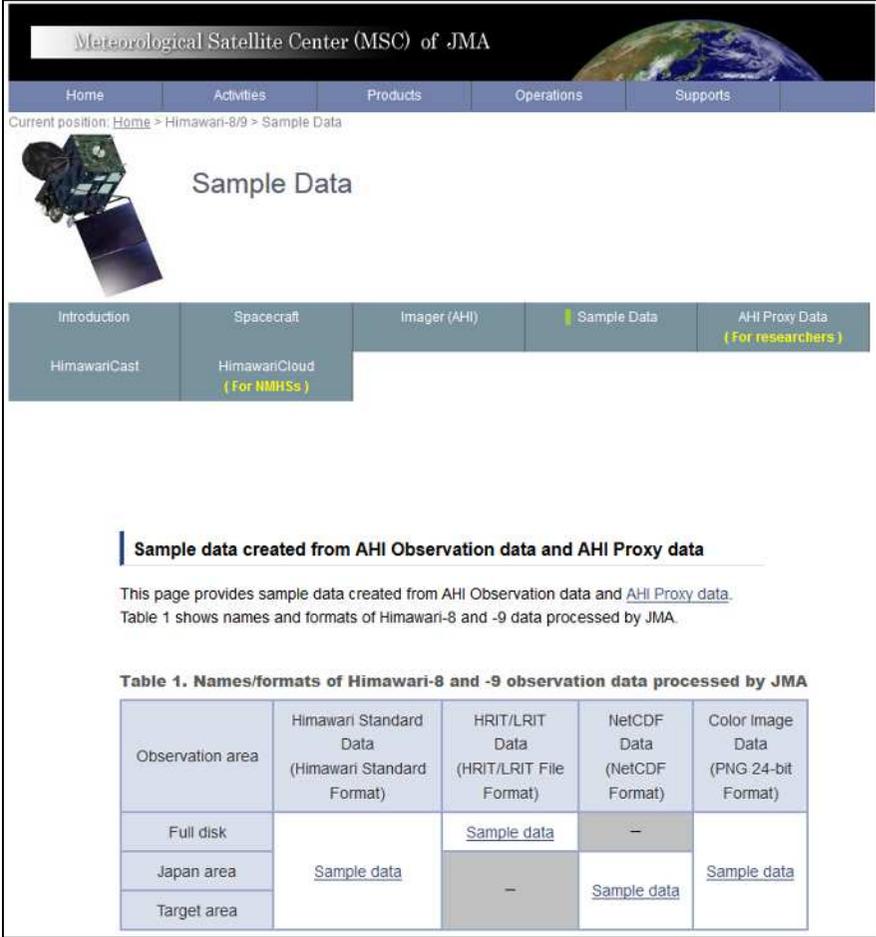
- * National Institute of information and Communications Technology
- ** Japan Aerospace Exploration Agency
- *** Data Integration and Analysis System
- **** Center for Environmental Remote Sensing

Support for User Readiness

< Himawari User's Guide >

Contents:

- Overview of satellite observation
- Overview of data dissemination
- Imager (AHI) specifications
- [Sample data](#)
 - Himawari Standard Data (HSD)
 - HRIT/LRIT files
 - NetCDF
 - PNG
- [Sample source code](#) to read HSD and convert into other formats



Meteorological Satellite Center (MSC) of JMA

Home Activities Products Operations Supports

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Sample Data

Introduction Spacecraft Imager (AHI) **Sample Data** AHI Proxy Data (For researchers)

HimawariCast HimawariCloud (For NMHSS)

Sample data created from AHI Observation data and AHI Proxy data

This page provides sample data created from AHI Observation data and [AHI Proxy data](#). Table 1 shows names and formats of Himawari-8 and -9 data processed by JMA.

Table 1. Names/formats of Himawari-8 and -9 observation data processed by JMA

Observation area	Himawari Standard Data (Himawari Standard Format)	HRIT/LRIT Data (HRIT/LRIT File Format)	NetCDF Data (NetCDF Format)	Color Image Data (PNG 24-bit Format)
Full disk		Sample data	--	
Japan area	Sample data			Sample data
Target area			Sample data	

<http://www.jma-net.go.jp/msc/en/support/index.html>

Summary



- Himawari-8 and 9 are the new-generation geostationary meteorological satellite. Himawari-8 has been operational since July 2015. Himawari-9 has been standby on orbit since March 2017 and is expected to take over the service in 2022.
- Himawari-8 and 9 carry a new imager which is a multi-channel passive imaging radiometer similar to the Advanced Baseline Imager (ABI) on the GOES-16.
- JMA distributes the Himawari data in two ways. One is the HimawariCast service via a communication satellite. The other is the HimawariCloud service over the Internet.



Meteorological Satellite Center of JMA

Thank you for your attention



Shadow of the moon crossing on the Earth surface during a solar eclipse